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Educational intervention for oral health

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Abstract

Introduction: Implementation and development of promotional and educational oral health programs, it is critical to identify and intervene on the risk factors for oral health in adolescents. **Research Question:** Does the oral health status of adolescents in particular DMFT index, plaque index, oral health risk and oral hygiene habits, suffer modification after participation in an educational program ProSorriso? **Purpose of the Study:** Implement a program of oral health education, to evaluate its effectiveness in improving the oral health of adolescents. **Methods:** Experimental analytical study-before and after the intervention program on the risk factors for oral health. A sample of 200 adolescents attending schools of Portugal, aged 11-16 years ($x=13.21\pm1.014$). **Material:** Risk Quantifiers in Oral Health assessed before and after participation in "ProSorriso" program. This aims at the promotion and education for oral health: oral health, diet and oral hygiene. **Results:** In the evaluation after the program ProSorriso: adolescents decreased the percentage of decayed teeth 50,5% to 38,5%; improved eating habits ($Z=-1,325, p=0,185$); had higher percentage of teeth without plaque ($Z=-5,465, p=0,000$). There were more adolescents to brush their teeth twice a day ($Z=-2,562, p=0,010$). The assessment of risk classification showed that before the educational program ProSorriso had a higher percentage of adolescents who were at high risk of developing oral problems ($p=0,001$). **Conclusion:** The intervention "ProSorriso" shown to produce effect in changing behaviors that promote healthier life styles and to be determinant of oral health status.

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1. Introduction

Health education is a key strategy in the process of acquisition of behaviors that promote and maintain health. Mastrantonio and Garcia (2002) point out that through education, across the life cycle, it is possible to transform negative attitudes into healthy habits, beneficial to the population. Adolescence is itself, "a window of opportunity to intervene early, not only preventing the initiation of risk behaviors, but influencing adherence to healthy behaviors that last throughout life" (Story, Neumark-Sztainer, Ireland, & Evans, 2000, p. 362). At this stage of life, is of particular importance to the promotion and health education, essential to help teenagers make a healthy transition to adulthood. As regards Ferreira (2008, p. 244) "the implementation of interventions focused education in lifestyles that are intended to optimize is one of the strategies to use to improve the health behaviors of adolescents."

In oral health, education is of utmost importance to its promotion. Should have as objectives to provide information enabling the acquisition of knowledge promoters of healthy behaviors (D'Cruz & Aradhya, 2013) that because "adolescence is seen as a period of increased risk for dental caries, due to poor control plaque and reduce tooth brushing care" (Tomita et al., 2001, p. 65). The privileged position of contact with adolescents in schools and health institutions, nurses, family physicians, pediatricians, dentists and hygienists should develop projects for this purpose, directed at this population group. To your success, education and motivation of adolescents are determinants in the oral health promotion process factors as they allow there is understanding of the need for care with your teeth, resulting in the maintenance of a satisfactory state of health (Gontijo, Eskenazi, Linhares, & Serra-Negra, 2004; Tebechrani & Menezes, 2000).

In this context, factors such as previous experience, lack of knowledge, decreased self-image, social or economic circumstances and situations, can cause negative emotional behaviors in relation to health. For this, the effectiveness of a program of oral health in adolescence depends, besides the type of resources used, the active involvement of young people and the strengthening of food education, oral hygiene, which can improve the knowledge, practices, gum health and lower levels of plaque and the risk for oral health (Ericsson, Ostberg, Wennstrom, & Abrahamsson, 2012).

2. Research question

Does the oral health status of adolescents in particular DMFT index, plaque index, oral health risk and oral hygiene habits, suffer modification after participation in an educational program ProSorriso?

3. Objectives of the study

Develop a program of educational intervention on oral health - ProSorriso.

Assess the effectiveness of the implementation of ProSorriso program on oral health (DMFT indices and IPS) and the risk for oral health of adolescents.

4. Material and methods

Experimental analytical study - before and after the intervention program on the risk factors for oral health without control group (Pallás & Villa, 2007), a sample of 200 adolescents, attending public schools in the Central Region of Portugal.

The instruments used for the collection of information were:

- Evaluation Sheet for Oral Health (DGS, 2008; WHO, 1997)
- Description of quantifiers Risk in Oral Health (DGS, 2006)

4.1. Procedures

The study was conducted in three phases, was first performed randomly selecting four schools (216 adolescents). Exclusion criteria were 7.5% of adolescents due to their absence in sessions of health education and/or data collection.

In the first phase a questionnaire was administered by the researcher in schools with the aim of assessing the risk in oral health, and the variables assessed were: 1) personal background; 2) content of the diet; 3) frequency of ingestion; 4) control of plaque; 5) use of fluorides; 6) motivation for oral health. After the questionnaire was carried out clinical examination by assessing the oral cavity (DMFT and IPS), the diagnostic criteria and intervention methodologies have been standardized in view of the reliability and comparability of the data collected with other studies, both domestic and international (WHO, 1999). The registration of DMFT index was calculated based on the procedures recommended by WHO (1997). The plaque index (PI) was obtained based on an objective examination of the oral cavity, having been used in the evaluation, a telltale sign of dye (erythrosine solution of 2%) and analyzed the buccal and lingual surfaces of teeth six predefined defined according to the classification criteria of Greene & Vermillion (1964) and DGS (2005).

Adolescents with cavities and other dental problems were referred for a dental consultation.

In the second phase of educational intervention revolved thematic oral health and nutrition, and consisted of four sessions of health education, which were held monthly in the context of the classroom, two theoretical oral health / oral hygiene and oral / food health, each with a duration of 45 minutes and two practice sessions on oral / tooth brushing hygiene, lasting 90 minutes each.

In the theoretical sessions of HE used the expository methods, using audiovisual, and the demonstrative method, in order to increase motivation and participation of adolescents. In demonstration of oral hygiene procedures macromodels (dentures, with molar tooth decay, brush and floss), for examples of the correct technique of brushing teeth were used.

At the end of each theoretical session proceeded to the distribution of illustrated booklets, which demonstrate the techniques of oral hygiene (brushing and using dental floss) and dissemination of page <http://www.prosorriso.host56.com>, created for the effect.

In the practice sessions we used the demonstrative method, using the material and technique, referred to in theoretical session. Every teenager had the opportunity to practice proper tooth brushing technique, in macro models, and in his own mouth with supervised brushing, using an individual oral hygiene kit (toothbrush and toothpaste) distributed.

In a playful way, in order to facilitate learning, educational games were held on oral hygiene and healthy eating.

The third phase began three months after the educational intervention program was performed to observe the oral cavity (DMFT assessment and IPS) again and distributed an individual (toothbrush and toothpaste) oral hygiene kit. A month after this observation was applied again, the instrument of data collection to teenagers.

Processing and analysis of data Statistical IBM program were used.

5. Participants

A sample of 200 adolescents who completed the program – ProSorriso. Data analysis revealed that the majority were female (56%) and were aged between 11 and 16 years, with an average of 13.21 years ($SD = 1.014$), and a low dispersion around the mean. The average age of girls is higher than boys, not yet observing statistical significance ($U = 4678.0$, $Z = -0.642$, $p = 0.521$), accepting why the age, is similar in both groups. They reside mostly in rural areas (72.5%) and 22.5% in urban areas. Values similar to those of the total sample, are observed in male and female (77.3% and 68.8% respectively), ($\chi^2 = 1.795$, $p = 0.180$). With regard to the school situation, 41.0% of adolescents attending the 7th grade, 33% 8th year and 22.7% year 9.

6. Results

In the implementation of a program of educational intervention is essential to evaluate its effectiveness. With this in mind, we proceeded to analyze the results of the study in order to ascertain whether there was a significant effect of the program. Thus, the subjects were observed with the same instruments before and after the intervention program - ProSorriso.

Risk for oral health

The observation of the mouths of teenagers, before the program - ProSorriso, it was established that 50.5% had

cavities and 30% did not. After participation in the program, it was found that the number of participants with caries decreases, however the differences are not significant ($p > 0.05$) (see Table 1).

Respect to variable personal history, before the program - ProSorriso, 98% of adolescents were healthy and 2% had disease or health condition that could directly or indirectly influence the process of decay. The assessment after enrollment - ProSorriso revealed that no patient had disease or health condition that may directly or indirectly influence the process of caries ($p < 0.05$) (see Table 1).

The Wilcoxon test shows that the differences between the two time points are not significant due to the variable content of the diet of adolescents ($p < 0.05$) (see Table 1).

Compared to the number of meals per day was found to ProSorriso before, most teens were up to five meals and a minority drank more than seven, secondly there is a decrease of teenagers makes a higher intake to seven meals a day and an increase of up to five participants who eat meals, the differences between the two time points were not significant ($p > 0.05$) (see Table 1).

There was an increase in the percentage of adolescents with clean teeth (no plaque) after participating in the program - ProSorriso and a decrease in apparent presence of plaque covering all dental surfaces and accumulation of plaque visible to the naked eye. Being the significant differences between the two time points, there is a better monitoring of the plaque after participation in the program ($p < 0.001$) (see Table 1).

Tabela 1 - Quantifiers of risk before and after program *ProSorriso* (1)

Gender	Before ProSorriso						After ProSorriso						Wilcoxon test
	Male		Female		Total		Male		Female		Total		
	N	%	n	%	n	%	N	%	n	%	N	%	
Objective oral examination (N=200)													
Free of cavities	21	23.9	39	34.8	60	30.0	27	30.7	37	33.0	64	32.0	Z=-1.39 p=0.164
Free of active cavities (index of cavities is the best in the age group in the area)	16	18.1	11	10.7	27	13.5	10	11.4	13	11.6	23	11.5	
Free of active cavities (index of cavities similar to the rest of age group in the area)	5	5.7	7	6.3	12	6.0	19	21.6	17	15.2	36	18.0	
With cavities	46	52.3	55	48.2	101	50.5	32	36.4	45	40.2	77	38.5	
Personal history (N=200)													
healthy	85	96.6	111	99.1	196	98.0	88	100.0	112	100.0	200	100.0	Z=-2.015 p=0.045*
With disease or health conition that can influence cavity formation	3	3.4	1	0.9	4	2.0	-	-	-	-	-	-	
Type of diet (N=200)													
Low ingestion of cariogenic foods	19	21.6	28	25.0	47	23.5	24	27.3	40	36.6	65	32.5	Z=-1.515 p=0.130
Moderate ingestions of cariogenic foods	50	56.8	67	59.8	117	58.5	42	47.7	57	50.9	99	49.5	
High ingestion of cariogenic foods	19	21.6	17	15.2	36	18.0	22	25.0	14	12.5	36	18.0	
Frequency of food ingestion (N=200)													
Up to 5 times per day	68	77.3	79	70.5	147	73.5	68	77.3	85	75.9	153	76.5	Z=-1.325 p=0.185
Res								0.2		-0.2			

Gender	Before ProSorriso						After ProSorriso						Wilcoxon test
	Male		Female		Total		Male		Female		Total		
	N	%	n	%	n	%	N	%	n	%	N	%	
≥ 5 and ≤ 7 times per day	16	18.2	27	24.1	43	21.5	20	22.7	24	21.4	44	22.0	
Res								0.2		-0.2			
More than 7 times per day	4	4.5	6	5.4	10	5.0	0	0.0	3	2.7	3	1.5	
Res								-1.5		1.5			
Plaque Control (N=200)													
Clean teeth	1	1.1	11	9.8	12	6.0	5	5.7	15	13.4	20	10.0	Z=-5.465 p=0.000***
Plaque covering half the dental surface	36	40.9	44	39.3	80	40.0	47	53.5	69	61.7	116	58.0	
Accumulation of plaque that can be seen with naked eye	42	47.7	42	37.5	84	42.0	30	34.0	23	21.4	53	26.5	
Obvious presence of plaque covering all dental surfaces	9	10.3	15	13.4	24	12.0	6	6.8	5	4.5	11	5.5	

As regards the use of fluoride toothpaste on brushing teeth, it has been found that before the program - ProSorriso, most teenagers made a daily brushing of teeth (2 times per day) with this type of dentifrice in the second stage, there is an increased percentage of adolescents to brush their teeth daily (2 times per day) with fluoridated toothpaste and a decrease in the form of an irregular shape. The differences between the two time points are significant ($p = 0.01$) (see Table 2). Regarding Motivation for oral health, it is inferred that the differences in the two moments are not significant ($p > 0.05$) (see Table 2).

It was concluded by the rating assessment of the risk that after participation in the program - ProSorriso lowered the percentage of adolescents with high-risk, so there is a greater number of adolescents with low risk of developing oral problems. The McNemar test showed that the differences found between the two time points are significant ($p = 0.001$), ie the teenagers had a lower risk of oral problems after participating in the program - ProSorriso (see Table 2).

Tabela 2 - Quantifiers of risk before and after the program - ProSorriso (2)

Gender	Before <i>ProSorriso</i>						After <i>ProSorriso</i>						Tests
	Male		Female		Total		Male		Female		Total		
	n	%	N	%	N	%	n	%	n	%	N	%	
Usage of fluoretos (N=200)													
Daily tooth brushing/ (2 x day)	47	53.5	75	67.0	122	61.0	56	63.6	90	80.4	147	73.5	Test Wilcoxon Z=2.562 p=0.010*
Daily toth brushing / (1 x day)	26	29.5	28	25.0	54	27.0	20	22.8	17	16.1	37	18.5	
Irregular tooth brushing (less than 1 x day)	15	17.0	9	8.0	24	12.0	12	13.6	4	3.5	16	8.0	
Motivation for oral health (N=200)													
Very favorable prognostics and compatible with the observation	-	-	2	1.8	2	1.0	2	2.3	8	7.1	10	5.0	Test Wilcoxon Z=-0.130 p=0.896
Res		-1.3		1.3				-1.6		1.6			

Gender	Before <i>ProSorriso</i>						After <i>ProSorriso</i>						Tests
	Male		Female		Total		Male		Female		Total		
	n	%	N	%	N	%	n	%	n	%	N	%	
Favorable prognostic compatible with the observation	35	39.8	47	42.0	83	41.5	31	35.2	49	43.8	80	40.0	
Res		-0.4		0.4				-1.2		1.2			
Prognostics less favorable than suggested by the observation	40	45.4	49	43.8	89	44.5	33	37.5	40	36.6	74	37.0	
Res		0.2		-0.2				0.1		-0.1			
The prospect of developing cavities is very large in short term	13	14.8	14	12.4	26	13.0	22	25.0	14	12.5	36	18.0	
Res		0.7		-0.7				2.3		-2.3			
Risk classification(N=200)													
Low risk	7	8.0	17	16.2	24	12.0	18	20.5	32	28.6	50	25.5	Test McNemnar p=0.001**
High risk	81	92.0	95	84.8	176	88.0	70	79.5	80	71.4	150	75.5	

7. Conclusion

The educational intervention program ProSorriso conducted in schools has proved effective because after participation in the program there was a reduction in the number of adolescents with decayed teeth, at risk of developing dental problems, in the plaque index, and consuming foods cariogenic and an increase in the number of teenagers who drank more often five meals a day.

It is suggested to replicate the implementation and evaluation of the educational program in oral health - ProSorriso in different national and international samples, in order to assess their effectiveness.

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